

Original Research

Postpartum depression, risk factors, support perception, and quality of life among primipara mothers in Rural Lanao del Sur, Philippines: A descriptive-predictive study



Iman U. Matumadi, Laarni A. Caorong , and Ashley A. Bangcola* 

College of Health Sciences, Mindanao State University-Marawi City, Philippines

Abstract

Background: The transition to motherhood is a significant life event that can be both exciting and challenging, often complicated by postpartum depression. Understanding the awareness, risk factors, and support systems related to postpartum depression is crucial for improving the quality of life among new mothers.

Objective: This study aimed to explore the quality of life, awareness of postpartum depression, level of depression, and perception of support among primipara postpartum mothers in selected Rural Health Units (RHUs) of Lanao del Sur, southern Philippines, while also examining the correlation between awareness of postpartum depression, perception of support, and quality of life.

Methods: A descriptive-predictive study design was employed. A stratified random sampling method was used to select 356 respondents from a population of 4,694. Data were collected using questionnaires, including a self-developed survey for postpartum depression awareness and perceived social support, the Edinburgh Postnatal Depression Scale for depression levels, and the WHOQOL-BREF for assessing quality of life. Descriptive statistics and regression analysis were applied to interpret the data.

* Correspondence:

Dr. Ashley A. Bangcola

College of Health Sciences, Mindanao State University, Marawi City, Philippines 9700

Email: ashley.bangcola@msumain.edu.ph

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Results: The majority of respondents were young, married women with diverse educational and income backgrounds. Moderate awareness of postpartum depression was noted, with many respondents reporting mild depression. Strong support systems involving family, friends, healthcare providers, and peer groups were identified as essential in managing postpartum depression. Regression analysis indicated that awareness of postpartum depression ($\beta = 0.400, p < 0.001$) positively influenced quality of life, whereas higher risk for postpartum depression ($\beta = -0.229, p < 0.001$) was associated with reduced quality of life.

Conclusion: These findings emphasize the need to enhance awareness and support systems to effectively manage postpartum depression, thereby improving the quality of life of postpartum mothers at risk. Improving health information dissemination and healthcare services is critical for addressing postpartum depression in rural settings.

Keywords

awareness; postpartum depression; quality of life; primipara mothers; new normal; Philippines

Background

Motherhood is a complex and transformative experience, presenting opportunities for joy and challenges. The quality of life (QoL) of postpartum mothers, particularly those experiencing their first childbirth (primipara), is crucial to maternal well-being. In rural areas like Lanao del Sur in the southern Philippines, access to healthcare resources and support is often limited, further compounding challenges related to maternal health ([Amit et al., 2022](#)).

Among these challenges is postpartum depression (PPD), a condition that significantly diminishes the quality of life for new mothers by affecting their mental, emotional, and physical well-being ([Gheorghe et al., 2021](#)). The quality of life of mothers during the postpartum period has been recognized as an essential indicator of broader maternal and child health outcomes ([Jeong et al., 2021](#)). However, it remains under-explored in rural settings, where socioeconomic conditions, healthcare infrastructure, and social support systems differ significantly from urban areas.

Postpartum depression, as a mental health issue, impacts not only the emotional state of mothers but also their ability to care for their newborns, thereby influencing the overall quality of life ([Hong & Buntup, 2023](#)). Awareness of PPD, access to support systems, and levels of depression are factors that play a critical role in either mitigating or exacerbating these negative impacts ([Baattaiah et al., 2023](#)). Yet, these factors have not been adequately examined in



the context of rural health, particularly in the Philippines. While numerous studies have been conducted on PPD and maternal health, they often overlook rural settings or fail to address how specific independent variables, such as awareness of PPD and perception of support, interact to affect the quality of life. These independent variables are crucial because the perception of support can either cushion or exacerbate the effects of PPD, while awareness of the condition is essential for timely intervention and management.

Existing studies primarily focus on urban or generalized populations, and there is a scarcity of research specifically addressing the quality of life among primipara mothers in rural areas. Moreover, much of the research has been conducted pre-COVID-19, which leaves a gap in understanding how the pandemic has influenced the quality of life for postpartum mothers in rural settings. Studies such as those by [Lebel et al. \(2020\)](#) and [Phipps et al. \(2023\)](#) have shown that COVID-19 has significantly increased the risk factors associated with PPD, including social isolation and limited access to healthcare. However, these studies do not fully explore the extent to which the awareness of PPD and the perception of support can influence a mother's quality of life during the pandemic, especially in rural and underserved areas.

Thus, this study seeks to fill this gap by examining the correlation between awareness of PPD, perception of support, and the quality of life among primipara postpartum mothers in selected Rural Health Units (RHUs) in Lanao del Sur. By focusing on these variables in a rural setting, our research aims to provide insights into how they jointly influence the quality of life. The goal is to inform healthcare policy and support programs tailored to the needs of new mothers in such communities.

Methods

Study Design

This study employed a descriptive-predictive research design, utilizing quantitative methods for data collection and analysis. The descriptive component focused on assessing the awareness of PPD, risk factors for PPD, perception of support, and the quality of life among primipara postpartum mothers. The predictive component aimed to analyze the relationships between these variables, specifically examining how awareness of PPD, risk factors for PPD, and perceived support influence the quality of life in the "new normal" among mothers in selected Rural Health Units in Lanao del Sur.



Samples/Participants

This study was conducted in five RHUs in Lanao del Sur, Philippines, selected based on the highest number of deliveries in 2022. The RHUs included were Malabang, Wao, Lumba Bayabao, Marantao, and Piagapo, with a total population of 4,694 mothers. A sample size of 356 primiparous mothers was calculated using the Raosoft online sample size calculator (<http://www.raosoft.com/samplesize.html>), with a 95% confidence level and a 5% margin of error.

Stratified random sampling was employed to ensure a representative sample from each of the five RHU). The population was divided into strata based on RHU location, and a proportional number of participants from each RHU was randomly selected. The inclusion criteria were that participants had no pre-existing mental health conditions, were first-time mothers aged 18-45, had given birth between February 2023 and August 2023, and were residents of the municipalities served by the selected RHUs. Random selection ensured that the sample was unbiased and representative of the broader population of primiparous mothers in the region.

Instruments

The research instrument for this study was developed to assess four key areas: awareness of PPD, risk for PPD, perceived support, and quality of life among primiparous mothers in selected RHUs of Lanao del Sur during the new normal.

It comprised five sections. The first section collected demographic information, including age, marital status, education, income, and living arrangements. The second section evaluated awareness of PPD through a researcher-developed 10-item Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items were created based on literature reviews and expert feedback to measure mothers' awareness of symptoms, causes, and potential interventions for PPD. The third section utilized the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987) to screen for postpartum depression, consisting of 10 items scored from 0 to 3, with total scores ranging from 0 to 30; higher scores indicate a greater risk for PPD, and a score of 10 or higher suggests the need for follow-up evaluation by a healthcare professional (Levis et al., 2020). The fourth section included a researcher-developed 12-item Likert scale (1-5) to assess the perceived support received by mothers, with items generated from existing models of social and family support systems, focusing on emotional, informational, and practical support.

Finally, the fifth section adapted the WHOQOL-BREF (The WHOQOL Group, 1995) to measure satisfaction with quality of life, encompassing 22 of the original



24 facets grouped across four domains: physical health, psychological health, social relationships, and environmental factors. Responses were scored on a Likert scale from 1 (very dissatisfied) to 5 (very satisfied), with higher scores reflecting better quality of life.

The development process for the new sections of the instrument, specifically the Awareness of PPD and Perceived Support scales, followed a systematic approach. Initially, items were generated through a comprehensive review of existing literature on PPD awareness and social support systems, identifying key themes and factors that could be translated into measurable items. To ensure content validity, three experts in maternal health – two with doctoral degrees in nursing and over five years of academic experience and one public health nurse with a master's degree – evaluated the initial item pool. They assessed each item for clarity, relevance, simplicity, and importance using a 4-point scale (1 = not clear to 4 = very clear), resulting in average ratings of 3.95 for the Awareness of PPD scale and 3.97 for the Perceived Support scale, indicating high content validity.

Construct validity was assessed through exploratory factor analysis (EFA) with a pilot sample, employing the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity to ensure the sample's adequacy for factor analysis. Items were organized into coherent factors, with low factor loadings (<0.4) removed to maintain alignment with the underlying constructs.

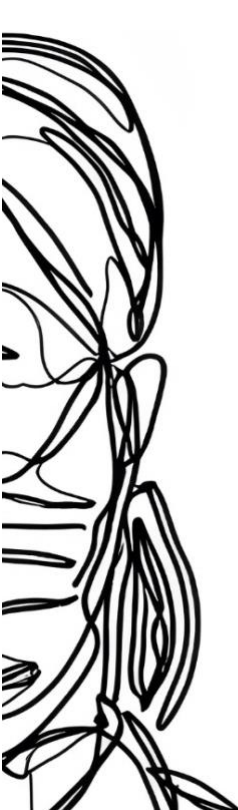
Reliability was evaluated using Cronbach's Alpha with a pilot sample of 30 respondents from a similar rural health unit (RHU), yielding a Cronbach's alpha of 0.813 for Awareness of PPD (indicating good reliability), 0.901 for Perceived Support (indicating excellent reliability), and an overall reliability of 0.857 (good reliability).

For standardized scales, the Edinburgh Postnatal Depression Scale (EPDS) was used with permission from the original authors and has been validated globally, including in the Philippines. Similarly, the WHOQOL-BREF was used with permission from the World Health Organization (WHO) and has been validated across various populations ([The WHOQOL Group, 1995](#)).

Data Collection

The data gathering procedure involved several key steps and took place between February 2023 and August 2023. Initially, ethical approval was obtained from the Research Ethics Committee of the authors' institution, as documented by certificate number CHS REC 2023-06. Following this, permission was sought from the Rural Health Units in Lanao del Sur to conduct the study.

Once permission was granted, respondents were informed about the study's objectives, procedures, and potential risks and benefits. Informed consent was



then obtained from all participants. Data collection involved administering a series of instruments: a demographic questionnaire, the EPDS, a questionnaire on PPD awareness and perceived support, and the WHO Quality of Life questionnaire. Data collectors, hired specifically for each municipality, ensured the secure handling and confidentiality of the data.

Questionnaires were completed in private areas within the Rural Health Units, allowing respondents sufficient time to answer. The data collection process adhered to ethical standards, ensured proper site permissions, secured respondent consent, and maintained data security.

Data Analysis

Data from the study on awareness, postpartum depression risk, support programs, and their impact on the quality of life among primiparous postpartum mothers in selected RHUs of Lanao del Sur were analyzed using IBM SPSS Version 25. Descriptive statistics, including frequency, percentage distribution, mean, and standard deviation, were utilized to summarize key variables related to awareness, PPD risk, support programs, and quality of life.

Inferential statistics were applied to examine the relationships between these variables, specifically Multiple Linear Regression (MLR). MLR was used to assess how multiple independent variables collectively influence the dependent variable, providing insights into the interactions among the variables under study.

Prior to conducting multiple regression analyses, key statistical assumptions were tested to validate the results. Multivariate normality was assessed through skewness, kurtosis values, and visual inspections of histograms and Q-Q plots. Multicollinearity was evaluated by calculating the Variance Inflation Factor (VIF) and Tolerance values for each independent variable, with VIF values below ten and tolerance values above 0.1 indicating the absence of multicollinearity. Additionally, scatterplots of residuals were examined to confirm linearity in relationships between predictors and the outcome variable, as well as homoscedasticity across data points. By ensuring these assumptions were met, the study's regression analysis yielded valid and reliable results, reinforcing the robustness of its conclusions.

Ethical Considerations

This study emphasized ethical considerations to safeguard respondents' rights and well-being. An ethics application, which included a detailed research protocol and compliance checklist, was approved by the College of Health Sciences Research Ethics Committee (CHS REC Code 2023-06) following an



expedited review. Permissions were obtained from the heads of the Rural Health Units (RHUs), and data collectors underwent training to ensure confidentiality. Informed consent was secured from all participants, who were provided with comprehensive information about the study’s purpose, methods, and their rights, including the option for voluntary participation and withdrawal. Data confidentiality was maintained in accordance with the Philippines’ Data Privacy Act of 2012, with secure storage and restricted access to both physical and digital data. The anonymity of respondents was preserved, and any published summary data was presented without identifying individuals.

Results

Awareness of Postpartum Depression

Table 1 presents the means, standard deviations, and descriptive interpretations regarding the respondents' awareness of PPD. The overall weighted mean score was 3.25, categorized as “Moderately Aware,” indicating that while respondents demonstrated strong awareness in some areas, there remain significant gaps in knowledge.

Table 1 Mean, standard deviation, and descriptive interpretation on the level of awareness of PPD

Awareness on PPD	Mean	SD	Descriptive Interpretation
Postpartum depression is a serious condition that can affect any woman who has given birth.	3.42	0.879	Very Aware
Symptoms of postpartum depression can include feelings of sadness, anxiety, and fatigue.	3.33	0.823	Very Aware
Postpartum depression can make it difficult to bond with your baby and may affect your ability to care for your child.	3.29	0.875	Very Aware
Postpartum depression can occur anytime within the first year after giving birth.	3.18	0.934	Moderately Aware
Having a history of depression or anxiety can increase the risk of developing postpartum depression.	3.01	0.951	Moderately Aware
Postpartum depression can be treated with a combination of therapy and medication.	3.05	0.882	Moderately Aware
It's important to seek help if you are experiencing symptoms of postpartum depression.	3.31	0.840	Very Aware
Support from family and friends can be helpful for women experiencing postpartum depression.	3.38	0.846	Very Aware
Postpartum depression can impact not only the mother, but also the entire family.	3.25	0.892	Moderately Aware
Screening for postpartum depression is important to ensure early detection and treatment.	3.32	0.871	Very Aware
Weighted Mean	3.254		Moderately Aware

Note: 1.00-1.75 = Not Aware; 2.51-3.25 = Moderately Aware; 1.76-2.50 = Slightly Aware; 3.26-4.00 = Very Aware

The results indicate that respondents had a strong awareness of the seriousness of PPD, its symptoms, the impact on maternal-infant bonding, and the importance of seeking help and social support. However, awareness

regarding PPD risk factors, treatment options, and the broader impact on the family was only moderate, highlighting areas where further education is necessary.

Level of Postpartum Depression

Table 2 summarizes the mean, standard deviation, and descriptive interpretation of the levels of postpartum depression reported by the participants. The average mean score indicated mild depression.

Table 2 Mean, standard deviation, and descriptive interpretation of the level of PPD (N = 356)

Level of Postpartum Depression	Mean	SD	Descriptive Interpretation
Were you able to laugh and see the funny side of things?	0.43	0.707	As much as I always could
Have you looked forward with enjoyment to things?	0.71	0.602	As much as I ever did
*Have you blamed yourself unnecessarily when things went wrong?	1.52	0.710	Not very often
Have you been anxious or worried for no good reason?	1.37	0.746	Hardly ever
*Have you felt scared or panicky for no very good reason?	1.20	.669	No, not much
* Have you been getting on top of yourself?	1.03	0.625	No, most of the time I have coped quite well
* Have you been so unhappy that you have had difficulty sleeping?	1.06	0.563	Not very often
* Have you felt sad or miserable?	1.01	0.593	Not very often
* Have you been so unhappy that you have been crying?	0.97	0.613	Only occasionally
* Is the thought of harming yourself has occurred to you?	0.16	0.413	Never
Average Mean Score	9.46		Mild Depression

Note: Items marked with an asterisk (*) are reverse scored (i.e., 3, 2, 1, and 0)

The respondents reported low levels of impairment in finding humor and enjoyment in activities, suggesting that they could maintain positivity and engagement despite challenges (Means = 0.43 and 0.71). However, mild symptoms of depression were evident, such as self-blame (Mean = 1.52), anxiety (Mean = 1.37), sadness (Mean: 1.01), occasional sleep difficulties (Mean = 1.06), and crying (Mean = 0.97). Notably, the low incidence of thoughts of self-harm (Mean = 0.16) suggests a lower risk of severe depressive symptoms.

Perception of Support

Table 3 displays the mean, standard deviation, and descriptive interpretation of the respondents' perceptions of support for postpartum mothers. The overall weighted mean score indicated strong agreement on the importance of support in managing PPD. The findings suggested strong agreement regarding the importance of support in managing PPD, with a weighted mean of 3.66. Respondents emphasized the need for a supportive and non-judgmental environment (Mean = 3.67), regular healthcare check-ins (Mean = 3.71), and



practical help such as meal delivery and childcare (Mean = 3.72). Education on PPD, promoting self-care, and providing mental health services were also considered essential (Means around 3.65). These findings underscore the critical role of a supportive environment in managing PPD.

Table 3 Mean, standard deviation, and descriptive interpretation of perception of support to postpartum mothers

Perception of Support to Postpartum Mothers	Mean	SD	Descriptive Interpretation
Support from family, friends, and healthcare providers is crucial for postpartum depression primipara mothers.	3.83	0.397	Strongly Agree
It's important to create a supportive and non-judgmental environment for postpartum depression primipara mothers.	3.67	0.537	Strongly Agree
Regular check-ins and appointments with a healthcare provider can help identify and address postpartum depression in primipara mothers.	3.71	0.509	Strongly Agree
Peer support groups can provide a sense of community and validation for postpartum depression primipara mothers.	3.45	0.515	Strongly Agree
Support from family for childcare can be helpful for postpartum depression primipara mothers who are struggling to balance caring for their child and their own needs.	3.67	0.470	Strongly Agree
Practical support such as meal delivery, help with household chores, and transportation can be invaluable for postpartum depression primipara mothers.	3.72	0.467	Strongly Agree
Providing education about postpartum depression and its symptoms can help primipara mothers recognize when they may need support.	3.67	0.470	Strongly Agree
Encouraging self-care practices such as exercise, sleep, and meditation can help postpartum depression primipara mothers manage their symptoms.	3.65	0.510	Strongly Agree
Offering mental health services, such as counseling or therapy, can provide postpartum depression primipara mothers with the tools to manage their symptoms.	3.65	0.476	Strongly Agree
Encouraging open communication and active listening can help postpartum depression primipara mothers feel heard and supported.	3.70	0.460	Strongly Agree
Creating a safe space for postpartum depression primipara mothers to share their experiences can help reduce stigma and increase awareness.	3.63	0.517	Strongly Agree
Encouraging family members to participate in support activities can help build a support network for postpartum depression primipara mothers.	3.64	0.515	Strongly Agree
Weighted Mean	3.66		Strongly Agree

Note: 1.00-1.75 = Strongly Disagree; 2.51-3.25 = Agree; 1.76-2.50 = Disagree; 3.26-4.00 = Strongly Agree

Quality of Life Regression Analysis

The regression analysis in [Table 4](#) revealed that awareness of PPD, the level of PPD, and perceived support moderately impact the quality of life among postpartum mothers, explaining 20.3% of the variance ($R^2 = 0.203$). Higher awareness of PPD was positively associated with better quality of life ($\beta = 0.400$, $p < 0.001$), while higher levels of PPD were linked to lower quality of life ($\beta = -0.229$, $p < 0.001$). However, perceived support did not show a significant direct impact on quality of life ($\beta = 0.013$, $p = 0.799$).

Prior to conducting the regression analysis, several key statistical assumptions were assessed to ensure the validity of the results (see [Table 5](#)). Multivariate normality was evaluated using the Shapiro-Wilk test, which yielded a p -value of

0.85, indicating that the normality assumption was met. Additionally, visual inspections of histograms and Q-Q plots confirmed the approximate normal distribution of the residuals.

Multicollinearity was assessed through the calculation of the Variance Inflation Factor (VIF) and Tolerance values for each independent variable. The results showed that all VIF values were below ten and tolerance values were above 0.1, indicating that there were no issues with multicollinearity among the predictors. Finally, linearity and homoscedasticity were verified by examining scatterplots of residuals. The random distribution of residuals indicated that the relationship between the predictors and the dependent variable was linear and that the variance of residuals was constant across different levels of the independent variables. The regression model produced consistent and reliable estimates across the data range.

These assumption tests reinforce the validity of the regression analysis, which found significant relationships between PPD awareness, levels of PPD, and perceived support with quality of life. Since the assumptions were met, the reported effects of higher awareness improving quality of life ($\beta = 0.400, p < 0.001$) and higher levels of PPD decreasing it ($\beta = -0.229, p < 0.001$) are both robust and reliable. Additionally, although perceived support did not directly impact the quality of life in the model ($\beta = 0.013, p = 0.799$), the lack of assumption violations strengthens the credibility of these results.

Table 4 Regression analysis of quality of life, awareness, level of depression, and perception of support to postpartum mothers ($N = 356$)

Variables	R ²	F	B	SE (B)	95% CI	β	Sig.
Quality of Life	0.203	29.85	83.05				<0.001
Awareness on PPD			1.262	0.157	[-0.051, 0.273]	0.4	<0.001
Level of PPD			-1.65	0.351	[0.014, 0.224]	-0.229	<0.001
Perceived support on PPD			0.078	0.306	[-0.086, 0.211]	0.013	0.799

Note: Dependent variable: Quality of life

Table 5 Assumption testing results for multiple regression

Assumption	Test	Result	Interpretation
Multivariate Normality	Shapiro-Wilk Test	$p = 0.85$	Assumption met; residuals are normally distributed
Multicollinearity	VIF and Tolerance	VIF < 10; Tolerance > 0.1	No multicollinearity among predictors
Linearity and Homoscedasticity	Scatterplots	Random distribution of residuals	Assumptions met; linearity and homoscedasticity confirmed

Discussion

The findings of this study highlight that respondents demonstrated a general awareness of PPD and its implications for maternal-infant bonding. However, awareness of specific risk factors and treatment options was moderate, indicating



a need for enhanced education and support focused on these areas ([Lever Taylor et al., 2021](#); [Qiu et al., 2022](#)). This gap emphasizes the need for targeted awareness campaigns to improve understanding of PPD's risk factors and available treatments ([Selma-Royo et al., 2020](#)).

The results indicate that respondents experienced mild depressive symptoms, such as self-blame and anxiety while having emotional resilience, as evidenced by low levels of impairment in finding humor and enjoyment. Importantly, the low incidence of self-harm thoughts suggests a relatively lower risk of severe depression among the respondents. These findings reinforce the critical importance of early detection and timely support to prevent worsening depressive symptoms, which can adversely affect maternal well-being and infant development ([Coates et al., 2018](#); [Pilav et al., 2022](#)).

Support networks are vital for managing PPD, with family, friends, healthcare providers, and peer groups playing crucial roles. A supportive environment, regular check-ins with healthcare providers, and practical help with childcare can significantly reduce stress and improve maternal well-being ([Murphy & Russell, 2023](#); [Ruybal & Siegel, 2017](#)). Education about PPD is also essential for reducing stigma, empowering mothers to seek help, and improving mental health outcomes ([Manso-Córdoba et al., 2020](#); [Zingg et al., 2021](#)).

Regarding quality of life, postpartum mothers reported moderate satisfaction, indicating a positive perception of their overall health and emotional stability despite the challenges of new motherhood. These insights emphasize the need for targeted interventions that enhance maternal autonomy and self-efficacy. Promoting self-care practices and person-centered maternity care can play a pivotal role in improving maternal and infant health outcomes ([Sakeah et al., 2018](#)).

PPD significantly diminishes maternal quality of life by impacting a mother's sense of competence and parenting capacity, which can create a cycle that worsens depression. This condition is linked to adverse outcomes, such as poor maternal-infant relations and developmental delays ([Alamoudi et al., 2017](#); [Tani & Castagna, 2017](#)). Early identification and intervention, along with comprehensive support systems, are critical for managing PPD effectively and improving outcomes for both mothers and infants ([Murphy & Russell, 2023](#); [Nagayasu et al., 2021](#)).

To sum up, the study's findings highlight the necessity of targeted educational initiatives and robust support systems to address PPD effectively, enhance the quality of life for postpartum mothers, and foster healthier maternal-infant relationships.



Limitations

The study's cross-sectional design limits the ability to establish causal relationships between variables. The sample, drawn from five RHUs in Lanao del Sur, may not be representative of all primiparous mothers in the Philippines. The study also did not explore the cultural context or control for all potential confounding factors, such as socioeconomic status and stigma, which may influence results.

Implications of this Study

The implications of this study are clear: healthcare providers and policymakers should prioritize initiatives that increase PPD awareness and develop robust support networks. By doing so, they can enhance the quality of life for postpartum mothers, promote maternal well-being, and ensure better health outcomes for both mothers and their children. Further research is needed to explore these dynamics and to design effective strategies for supporting postpartum mothers.

Conclusion

This study emphasizes the critical need to understand PPD and its impact on primipara mothers in rural health units of Lanao del Sur. Despite varying socioeconomic backgrounds, the findings revealed that respondents had a high level of awareness about PPD symptoms and the importance of seeking help, recognizing PPD as a significant mental health concern. While many mothers maintained a positive outlook and demonstrated resilience, some experienced mild depressive symptoms.

The results highlight the essential role of comprehensive support systems, including family, friends, healthcare providers, and peer groups, in managing PPD. Higher awareness of PPD was associated with better quality of life, whereas an increased risk for PPD was linked to lower quality of life. Interestingly, direct support did not show a significant impact on quality of life, suggesting that other factors may influence maternal well-being. These insights point to the necessity for targeted interventions aimed at raising awareness, mitigating risk factors, and enhancing support systems to improve the quality of life for postpartum mothers.

Declaration of Conflicting Interest

The authors declare no conflicts of interest related to this study. The research was conducted independently, and no financial or personal relationships influenced the outcomes.

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Authors' Contributions

Iman U. Matumadi contributed to the study conception and design as well as data gathering. Laarni A. Caorong and Ashley A. Bangcola contributed to the supervision of the study and critical revisions of important intellectual content. All authors approved the final version of the article to be published.

Authors' Biographies

Iman U. Matumadi is a student at the College of Health Sciences, Mindanao State University, Marawi City, Philippines.

Dr. Laarni A. Caorong, RN, MAN, is an Associate Professor at the College of Health Sciences, Mindanao State University, Marawi City, Philippines.

Dr. Ashley A. Bangcola is an Associate Professor at the College of Health Sciences, Mindanao State University, Marawi City, Philippines.

Data Availability Statement

The dataset generated during and analyzed during the current study is available from the corresponding author upon reasonable request.

Declaration of the Use of AI in Scientific Writing

None.

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